CLAIMS

WHAT IS CLAIMED IS:

1. Use of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment of dry eye, wherein the medicament is to be administered in alternating nostrils of an individual in need thereof.

2. Use of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment of ocular discomfort, wherein the medicament is to be administered in alternating nostrils of an individual in need thereof.

3. Use of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for increasing tear production, wherein the medicament is to be administered in alternating nostrils of an individual in need thereof.

4. The use according to any one of claims 1-3, wherein the pharmaceutically acceptable salt is a galactarate or citrate salt of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine.

5. The use according to any one of claims 1-4, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine mono-citrate.

6. The use according to any one of claims 1-4, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate.

7. The use according to any one of claims 1-4, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate dihydrate or (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate monohydrate.

8. The use according to any one of claims 1-7, wherein between 1 microgram and 5 milligrams of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, are to be administered in alternating nostrils of the individual in need thereof.

9. The use according to any one of claims 1-7, wherein between 1 microgram and 2 milligrams of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, are to be administered in alternating nostrils of the individual in need thereof.

10. The use according to any one of claims 1-7, wherein between 100 micrograms and 1000 micrograms of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, are to be administered in alternating nostrils of the individual in need thereof.

11. The use according to any one of claims 1-10, wherein the medicament is to be administered with one or more substances that prevent the entry or reduce the entry of the nicotinic acetylcholine receptor into the desensitized state, or facilitate the recovery of a peripheral nicotinic acetylcholine receptor from the desensitized state.

12. The use according to claim 11, wherein the one or more substances are selected from the group consisting of protein kinase C (PKC) or factors that upregulate or up-modulate PKC, cAMP-dependent protein kinase (PKA) or factors that upregulate or up-modulate PKA, and calcineurin inhibitors.

13. The use according to claim 12, wherein the calcineurin inhibitor is selected from the group consisting of cyclosporine, pimecrolimus, and tacrolimus.

14. The use according to any one of claims 1-13, wherein (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered at least once daily.

15. The use according to any one of claims 1-13, wherein (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered at least twice daily.

16. The use according to any one of claims 1-15, wherein (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered as a liquid, suspension, aerosol, gel, ointment, dry powder, cream, paste, lotion, or balm.

17. The use according to any one of claims 1-16, wherein (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered by a syringe, dropper, bottle nebulizer, atomization pump, inhaler, powder spray device, vaporizer, patch, medicated stick, pipette, or jet of liquid.

18. The use according to any one of claims 1-17, wherein the (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered in a pharmaceutical formulation for nasal administration comprising between 10 mg/mL and 25 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

19. The use according to any one of claims 1-17, wherein the (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered in a pharmaceutical formulation for nasal administration comprising between 5 mg/mL and 50 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

20. The use according to any one of claims 1-17, wherein the (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered in a pharmaceutical formulation for nasal administration comprising about 5 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

21. The use according to any one of claims 1-17, wherein the (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered in a pharmaceutical formulation for nasal administration comprising about 10 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

22. The use according to any one of claims 1-21, wherein the (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, is to be administered prior to or after LASIK eye surgery.

23. A pharmaceutical formulation comprising (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, formulated to be administered in alternating nostrils of an individual in need thereof for use in the treatment of dry eye.

24. A pharmaceutical formulation comprising (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, formulated to be administered in alternating nostrils of an individual in need thereof for use in the treatment of ocular discomfort.

25. A pharmaceutical formulation comprising (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, formulated to be administered in alternating nostrils of an individual in need thereof for increasing tear production.

26. The pharmaceutical formulation according to any one of claims 23 to 25, wherein the pharmaceutically acceptable salt is a galactarate or citrate salt.

27. The pharmaceutical formulation according to any one of claims 23 to 26, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine mono-citrate.

28. The pharmaceutical formulation according to any one of claims 23 to 26, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate.

29. The pharmaceutical formulation according to any one of claims 23 to 26, wherein the pharmaceutically acceptable salt is (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate dihydrate or (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine hemigalactarate monohydrate.

30. The pharmaceutical formulation according to any one of claims 23 to 29, comprising between 1 microgram and 5 milligrams of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, per dose.

31. The pharmaceutical formulation according to any one of claims 23 to 29, comprising between 1 microgram and 2 milligrams of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, per dose.

32. The pharmaceutical formulation according to any one of claims 23 to 29, comprising between 100 micrograms and 1000 micrograms of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof, per dose.

33. The pharmaceutical formulation according to any one of claims 23 to 32, wherein the pharmaceutical formulation is a liquid, suspension, aerosol, gel, ointment, dry powder, cream, paste, lotion, or balm.

34. The pharmaceutical formulation according to any one of claims 23 to 33, wherein the pharmaceutical formulation is provided in conjunction with a syringe, dropper, bottle nebulizer, atomization pump, inhaler, powder spray device, vaporizer, patch, medicated stick, pipette, or jet of liquid.

35. The pharmaceutical formulation according to any one of claims 23 to 34, wherein the pharmaceutical formulation comprises between 10 mg/mL and 25 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

36. The pharmaceutical formulation according to any one of claims 23 to 34, wherein the pharmaceutical formulation comprises between 5 mg/mL and 50 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

37. The pharmaceutical formulation according to any one of claims 23 to 34, wherein the pharmaceutical formulation comprises about 5 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

38. The pharmaceutical formulation according to any one of claims 23 to 34, wherein the pharmaceutical formulation comprises about 10 mg/mL of (R)-5-((E)-2-pyrrolidin-3-ylvinyl)pyrimidine, or a pharmaceutically acceptable salt thereof.

39. Use of the pharmaceutical formulation of any one of claims 23 to 38 in the manufacture of a medicament for the treatment of dry eye.

40. Use of the pharmaceutical formulation of any one of claims 23 to 38 in the manufacture of a medicament for the treatment of ocular discomfort.

41. Use of the pharmaceutical formulation of any one of claims 23 to 38 in the manufacture of a medicament for increasing tear production.